OFFICIAL   PET   USERS   CLUB   NEWSLETTER

ISSUE   No.   Ø5

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We like to publish interesting features from PET Users
about their applications and set-ups.  If you would like
to contribute to the next Newsletter, please send your
article, letter or comments to:

The Editor,
PET Users Club,
Commodore Systems,
360 Euston Road,
London NW1 3BL

*Please note:  To provide a good information service to PET Users, we
regularly mention equipment, software and services offered by companies
and individuals not directly linked to Commodore.  In doing so, we are
not making recommendations and cannot be held responsible for the
validity of any statements made.*

# S T O P   P R E S S

## COMMODORE NEWS

### New Products For 1979.

Many readers frequently ask about Commodore's future product
plans so we are taking the opportunity of bringing you up to
date on these for the first half of 1979.  We will be keeping
you fully up to date in this newsletter and would appreciate
you not calling up our office at frequent intervals to "check
the latest news", as this can sometimes block the switchboard
to other users and enquirers who indeed we may be able to assist.

Our planned range, anticipated introduction dates and pricing
are as follows:

| COMPUTERS | Recommended Ex VAT | Recommended Inc VAT | Planned Initial Availability |
|---|---|---|---|
| 2001-4 | £ 460.00 | £ 496.80 | February |
| 2001-8 | £ 550.00 | £ 594.00 | Current |
| 2001-16N | £ 675.00 | £ 729.00 | May |
| 2001-32N | £ 795.00 | £ 858.60 | May |

| PRINTERS | | | |
|---|---|---|---|
| 2023 | £ 550.00 | £ 594.00 | April |
| 2022 | £ 645.00 | £ 696.60 | April |

| FLOPPY DISC | | | |
|---|---|---|---|
| 2040 | £ 740.00 | £ 799.20 | May |

| EXTERNAL CASSETTE DECK | | | |
|---|---|---|---|
| C2N | £ 55.00 | £ 59.40 | Current |

| KIM RANGE | | | |
|---|---|---|---|
| KIM 1 | £ 99.95 | £ 107.95 | Current |
| KIM 3 | £ 129.95 | £ 140.35 | Current |
| KIM 4 | £ 69.95 | £ 75.55 | Current |

Effective February 1st. 1979.

A brief description of the new products is given below as we
have only just released information on these in the USA.
Fuller reviews will be incorporated in the future newsletters.

## PET 2001-4

This is a 4K RAM version of the current PET 2001-8. Please note
that a number of our programs are designed to run on large RAM
memory versions of the PET. However, this machine does give an
outstanding value budget price computer for under £500. Memory
can be added at a later date by internally adding plug-in RAM
to increase up to the standard 8K. For educational purposes
our Basic Basic Tutorial works in 4K. Lists of other progr ms
that will work in 4K will be in future newsletters.

## PET 2001-8

Due to the large volume of sales we have now reached on PETs
we are able to pass on the savings on our overheads to offer
even more outstanding value for money on this very popular
Product.

## PET 2001-16N

This will be a large typewriter size keyboard version of our
current PET 2001-8 with 16K of dynamic RAM memory. In order
to accommodate this larger keyboard the internal cassette
deck is not built in and will have to be bought separately if
required. Programs designed to run on the PET 2001-8 will run
without modification on this model.

## PET 2001-32N

This will be as for PET 2001-16N but incorporating 32K of
dynamic RAM as standard. Commodore will not be offering
as standard upgrade from the 16K version to the 32K version.

## PET 2020 PRINTER

As you will be aware we have experienced a number of technical
problems on this product and have reluctantly decided to cancel
the product in favour of alternative designs which we feel will
be of the quality and features we can be proud to put our
Commodore Systems PET name on. Any users who currently have orders
with Commodore for this product are being written to separately
- others should contact their dealer. We sincerely apologise
for the problems that this product may have caused you.

## PET 2023 PRINTER

This will contain the features of the original 2020 printer as
reviewed in our earlier newsletter but with what we consider to
be a significantly better quality and a more reliable
print head. It is also being built in a steel cabinet to match
in with the styling and robustness of the PET computer itself.

**2040**

# Dual Drive Floppy Disk

The Dual Drive Floppy is the latest in Disk technology with extremely large storage capability and excellent file management. As the Commodore disk is an "Intelligent" peripheral, it uses none of the RAM (user) memory of the PET™. The Floppy Disk operating system used with the PET™ computer enables a program to read or write data in the background while simultaneously transferring data over the IEEE to the PET™. The Floppy Disk is a reliable low cost unit, and is convenient for high speed data transfer. Due to the latest technological advances incorporated in this disk, a total of 360K bytes are available in the two standard 5¼" disks, without the problems of double tracking or double density. This is achieved by the use of two microprocessors and fifteen memory I.C.s built into the disk unit. Only two connections are necessary — an A/C cord and PET™ interface cord.

## Specifications:

**Microcomputer system devices**
Controller
    6504    microprocessor
    6530    I/O, RAM, and 1K ROM software
    6316    2K ROM for encoding & decoding disk data
    6522    I/O and interval timers
File interface
    6502    microprocessor
(2) 6532    RAM, I/O, interval timers
(2) 6332    4K ROM each (total 8K disk operating system)
Shared RAM
(8) 6114    1K x 4 bit static RAM (total 4K bytes)

**Disk drives**
(2) Shugart Associates SA390 drives
standard minifloppy (5¼" disk)
activity LED's light when a file is open on that drive

*2040*
*Dual Drive Floppy Disk*

**Packaging**
18 gauge all steel cabinet
Dimensions: width — 15", depth — 14.35", height — 6.5"
Cover hinges from base for servicing

**Diskette organization**
Formatting is by the drive itself — any mini-floppy
    diskette may be used
35 concentric tracks
constant density recording on each track
varying number of sectors per track —
    innermost: 17        outermost: 21
176640 bytes on a single side
Track 18 used for directory
171520 bytes for user storage
Soft-sectoring
Diskettes for dual side recording may be used

**Data interface**
IEEE-488
Standard 24-pin stacking connector
Device #8-15 by jumper option
full listener — talker
recognizes secondary addressing

**Floppy Disk Command set (summary)**
        Notes
D   :=   Drive #, 0 or 1
E   :=   IEEE device # of floppy
L   :=   Logical file #
C   :=   Channel # ( 2<= C <=15 )
CL:=   Logical file # for command channel

*   :=   Pattern symbol matches any number of characters
?   :=   Pattern symbol matches exactly one character

"?" may appear anywhere, "*" may only appear on right
    side of pattern.

Example:   "N?M*" matches
            "NEW",   "NUM",   "NAME",   "NUMBER"

Files must begin W/ cap letter from A to Z & may have
    16 characters.

Pattern matching W/ file names may be used only when:
    Loading directory ($)
    Scratching files
    Opening read channels
    Loading programs

Default drive #'s may be used in most cases.
Using a ":" without a drive # indicates a default to the
    previously determined drive #. A file name with no drive
    # or ":" indicates that the file is to be looked up on both
    drives, beginning with the previously determined
    drive #. A ":" must separate commands from file
    names as described above.
Commands may be abreviated to any form that retains
    the 1st char.

# Editorial

We hope this issue will have reached you reasonably soon after
the last one.  We are in the process of transferring the
mailing operation to a specialist company and this, together
with other changes, should help to improve the regularity
of the Newsletter.

Although we are still short of "Applications" articles, we
are pleased to see that more and more readers are sending in
letters and articles.  Anyone who would be interested in
writing a regular small section about a field in which they
have a specialist interest (such as Interfacing, Business
Software, Programming Routines, Education, etc) should write
to the Editor.

We are pleased to announce that Mike Niklaus will now be
editing a regular section of this Newsletter entitled
"PRINTOUT" and will be covering various aspects of
programming and using a PET.

## INDEPENDENT USER GROUPS

We have been asked to state our policy on the formation of
independent groups and newsletters in view of the number
that have recently been announced.  We are wholeheartedly in
support of these groups and as such will continue to give
them free publicity through the pages of this Newsletter.
Because they fulfil a different role to the Pet Users Club
we do not regard them as competition.  Most of our members
have joined us because we represent the official Commodore
voice and that is why, despite several offers from independent
groups, we have continued to edit and produce the Newsletter
inside Commodore.

## TECHNICAL QUERIES

Although we like to think that the PET has one of the best technical back-up services of any low cost computer, we have recently been receiving a large number of technical queries on the telephone at the Sales Office - resulting in "jammed" telephone lines.

If you have a problem, we suggest the following course of action:

1)  If it is a service query, contact your dealer or, if purchased direct from Commodore, ring our Service Manager (Mr. David Briggs) on 0642 780014.

2)  If it is an operational or programming query, first check the relevant Commodore documentation (including back issues of the PUC Newsletter) to see if the query has already been answered. If not, contact your local dealer - many of whom are equally well, if not better, equipped to give technical advice.

Not long ago, we referred a customer with a complex interfacing problem to Fairhurst Instruments (telephone 0625 525694) a dealer who specialises in that field. Apparently, the customer was so pleased with the service he received that the next time he needed some interfacing advice he hired a private plane for a day and flew down to consult them!!


## BOOK REVIEWS

In response to several requests, we hope to start reviewing the increasing number of publications associated with the PET and the 6502 microprocessor. It would greatly assist us if anyone who has read such a book would write to us with their comments or maybe even write a review for us.


Richard Pawson

# Software Notes

This has been the month of Jim Butterfield. Jim must be one of the most eminent 6502 people around. When MOS produced their excellent manuals for the KIM 1 Board, Jim, probably more than any other single individual, helped to make KIM a success by producing the Book of KIM, which is still indispensable for any 6502 user. For use on the PET, relocation of some of the programs may be necessary and Jim has some excellent relocation routines in the Book of KIM to do this. A lot of this issue of our Newsletter is concerned with passing on to you some of the fascinating things he talked about when he was here. The merge routine, developed by Brad Templeton and discussed by Richard in this issue, is masterly and despite some problems claimed by Ron Greere (editor of the newly formed independent Pet Users Group) we report no difficulty using Jim's technique.

## GRAND STAR TREK COMPETITION

The best PET Star Trek I have seen was written by Leonard Tramiel who is the son of Jack, the chairman of our company. Leonard has used PET graphics in Star Trek to great effect - although some may not approve of his use of letters for Klingons and Enterprise. The problem, despite the excellence of the program, is that there is no damage control or instructions, but there is 1.5K of space. Whilst instructions can be offered as a separate program, my personal tastes demand that Klingons be moved. I would also like variable topology universes, eg Torus, Cylinder, etc..

So we proclaim a Grand Star Trek Competition. We have already had several submissions but not all of these programs make full use of PET graphics. There will be three prizes in the competition, the two runners-up will have listings published in the Newsletter and be given three choices of software from our Master Library. The winner will be published with whatever accolades we can muster, and the usual royalty of 10% sales value will be paid. Since Commodore does not yet have its own Star Trek the winner might become a rich man in a few years' time!

## Software Required

On a more serious note, it is my intention to aim software at particular professional groups.  I know already that we have doctors, solicitors, accountants, stock brokers, farmers, engineers, scientists, hoteliers, restaurateurs, hairdressers, publishers, estate agents, pharmacists and architects using PETs.  Let me know what your profession needs and we'll get it written.

If you are in one of these groups, start thinking about the sort of software systems you want from us and talk to me.  This time next year I hope to have several disc based suites to offer - but only if I get a clear idea from you what you want now.

This column is going to be a regular feature of the Newsletter so I'll keep you up to date with developments.

Lastly, apologies for the delays with Maths. and Stats..  The programs are ready now and we will take orders.  The description of all the new software follows.

Keep on hacking!


R. N. Green

*All new programs are for use on the standard 8K, single cassette PET
2001 Computer.*

## MPØ33 - BOOKS - £12.00

The "BOOKS" 2.0 book-keeping program has been professionally written for
students of accounting, so that they may familiarise themselves with the
processes of double entry book-keeping by seeing the impact of transactions
upon displayed accounting statements.  The program is also useful to
persons preparing or simulating the accounts of small businesses, in
that figures entered as a simplified trial balance may be directly
displayed as accounting statements and further amended at will by the
entry of transactions in the usual way.

## MPØ32 - BACKGAMMON - £8.00

Plays Backgammon against you or against itself.  An "aggression" level
between 0-12 can be set.  Complete introductory instructions included.

## MPØ31 - USER PORT COOKBOOK - £10.00

A manual for connecting devices to the User Port.  A program which lets
you maintain and modify any registers you wish is included.  The 6522
specification is included as an appendix.

## MPØØ7 - BASIC MATHS PACKAGE - £15.00

This does matrix addition, multiplication, determinants and inverses to
13 x 13, solution of simultaneous linear equations, vector and plane
geometry calculations, integration by trapezoidal, Simpson's rule or
Gaussian quadrature, differentation.

## MPØØ8 - BASIC STATISTICS PACKAGE I - £15.00

Mean, median, variance, standard deviation, skewness, kurtosis, frequency
distribution, linear regression, T-tests, correlation analyses.  Data is
handled in DATA statements.

## MPØ38 - BASIC STATISTICS PACKAGE  II - £15.00

Six commonly used tests for running directly with data tapes:  Paired t,
Unpaired t, Linear Regression, Man-Whitney, Wilcoxon, Spearman.

## MP∅39 – STRATHCLYDE BASIC COURSE                           £8.00

Written by Professor Andrew Collin who uses it to give newcomers to computing
a very rigorous introduction to the PET and its Basic.  The package contains
12 programs and a large Workbook with many examples.  The package is thoroughly
reccommended.


## MP∅39A – STRATHCLYDE BASIC COURSE WORKBOOK                 £3.00

For those of you who require additional copies  of the course workbook,
without the program cassettes.


## PROGRAM REVIEW


SNARK:    An Abstract Teaching Machine

There is now a growing interest amongst PET Users in writing small programs
or subroutines in Machine Language.  These can then be executed on the PET
by means of the USR and SYS functions.  Although there are now a number of
programming aids such as Assembler, Disassembler, Machine Language Monitor
and Hex editor/loader, it is still fairly difficult for the beginner to
grasp the concepts of accumulators and addressing modes for example, even
with good documentation.  SNARK is a program that simulates a small micro-
computer in order to teach simple Assembly Language (and hence machine-code)
programming.

Written by Professor Andrew Collin of Strathclyde University (whose Computer
Science Department uses many PETs to teach programming) both the SNARK
program and documentation are very easy to understand.  Most people with a
reasonable amount of experience with BASIC could expect to be writing crude
assembly language programs within a few minutes of loading SNARK.

For those who understand such terms, the machine has two accumulators and
accepts the following functions:


LDA       Load operand to accumulator
STA       Store contents of accumulator
ADD       Add operand to accumulator
SUB       Subtract operand from accumulator

| AND | Logical 'and' operand with accumulator |
| --- | --- |
| ORA | Logical 'or' operand with accumulator |
| JMP | Jump unconditionally to stated address |
| BZE | Jump if selected accumulator = 0 |
| BNZ | Jump if selected accumulator = 0 |
| BMI | Jump if selected accumulator $<$ 0 |
| BPL | Jump if selected accumulator $\geq$ 0 |

each working on either the A or B accumulators in one of these four address modes:

i)      Immediate mode

ii)     Direct mode

iii)    Indexed by A

iv)    Indexed by B

In addition there are a number of other functions such as inputing from the keyboard and printing onto the screen.

Programs written in SNARK language may be dumped onto tape and retrieved later. Various de-bugging aids are incorporated such as execution of a program step by step.

Although SNARK is an abstract language, it is essentially geared around 6500 Machine Language and hence is ideal for anyone wanting to put his PET's Machine Language capability to good use. The SNARK program is available on cassette tape with a full documentation booklet for £12.00 including VAT and P & P, Order Number MP∅26.

NEW ADDITIONS TO THE COMMON LIBRARY

| PROGRAM NUMBER | NAME | AUTHOR | DESCRIPTION |
|---|---|---|---|
| CLØ33 | 4K PLOT | Peter Hirst | Explains and calculates a high (4000) cell resolution plot |
| CLØ34 | DENSE Y PLOT | Francis T. Chambers | Tutorial - demo's. various curves plotted on a 184X35 grid - nice graphics |
| CLØ35 | TAPESTRY | Francis T. Chambers | Draws random or User programmed designs |
| CLØ36 | MAGIC SQUARE | R. N. Hainsworth | Generates a magic 4X4 square for any number |
| CLØ37 | MASTERMIND | Chris Corbett | 2 levels of play and good graphics |
| CLØ38 | NIM GAME | P. J. Reeve | The ancient 3 group Nim game |
| CLØ39 | KIMS GAME | James Bryant | Memory Test |
| CLØ4Ø | MAZER | Mr. M. Smith | Escape from a maze before it surrounds you. |
| CLØ41 | PATTERN 2 | Unknown | Generates patterns |
| CLØ42 | MINATOR | A. W. Mace | Surround the minator before he eats you! |
| CLØ43 | MAZE GAME | Jan Owen | Travel through a maze against the clock - very good graphics |
| CLØ44 | DICE GAME | Jan Owen | User definable prob- ability game based on dice with betting |
| CLØ45 | BASE CONVERSIONS | Jan Owen | Any base to any base |
| CLØ46 | SHOOT | Sean McKewn | 3 levels of play - shoot the stars |
| CLØ47 | PUZZLE | Peter Bell | Move 15 counters on 4X4 board into order |
| CLØ48 | OSCAR | Ken Ottway | Calculates location of radio amateur satelites |
| CLØ49 | HP45 SIMULATOR | Chris Corbett | Simulates HP45 calculators |

## EDUCATIONAL COMMON LIBRARY

| CL 500 | COUNTING | E. Khabie-Zeitoune | A teaching program for infants |
|--------|----------|--------------------|--------------------------------|
| CL 501 | HELMHOLTZ COILS | Chris Varley | 3 physics programs from Chris Varley - Nuffield oriented |
| CL 502 | RANDOM DECAY | Chris Varley | |
| CL 503 | SCHRODINGER | Chris Varley | "    "    "    " |
| CL 504 | MATHS | A. J. Clark | Matrix/Vector/Trig/Integration |
| CL 505 | HANGMAN | Jan Owen | 400 word version of Hangman |
| CL 506 | MOMENTUM 422 | Paul Caswell | Momentum conservation |
| CL 507 | CHAGGA FARMER | Paul Caswell | Farming Simulation |
| CL 508 | MOLECULAR DIFFUSION | Paul Caswell | Kinetic Theory topic |
| CL 509 | ENZKIN | David Williams | Enzyme Kinetics - both adapted from Chelsea Science Simulations |
| CL 510 | LINKOVER | David Williams | |

ECL Software will be reviewed in the next issue of Users' Newsletter.

The standard of some of the recent submissions to the Common Library is such that it is our intention to repackage and, in some cases, promote to the Master Library. We will write to the authors about this.

Thanks to all of you.

## TITLES OF RECENT SUBMISSIONS

PEEK REGISTERS

VAT RECKONER

QUESTIONS

PETUNE

M/c CODE MONITOR (improved)

CABLE SIZES

SIMULTANEOUS EQUATIONS

AUDIO TEST

LEDGER ACCOUNT

BUSINESS ACCOUNT

BATTLE SHIPS

GENERAL LEDGER

FORMULA I

GAUSS JORDAN

CRICKET

BLACKJACK

ECONOMIC ORDER QUANTITY

PROFIT AND SALES VOLUME

LINE RENUMBER

CESIL INTERPRETER (X2)

POLARIS

Those which are suitable will be available in a few weeks time.

# Peripherals & Attachments

EXTERNAL MEMORY EXPANSION

PLESSEY MICROSYSTEMS have recently launched a range of memory expansion units
for the PET called PETITE.  Although there are now a number of different
memory expansion board designs (such as PME-1 and EXPANDAPET) available
in this country, the PETITE is the first completely self-contained unit.

It measures 304 x 210 x 84 mm and stands on the bench to the side of a
PET, connecting to the memory expansion port.  The power supply to the
PETITE comes directly from the mains through its own lead and transformer,
thus adding no load to PET's own power supply.  Any additional heat from
the memory expansion is dissipated direct to the atmosphere and not into
the PET's casing.  Installation is simplicity itself - just one 40-way
edge connector, and hence the expansion memory can quickly be swopped
between two PETs.

Four configurations of the unit are available as follows:

|  |  |
|---|---|
| PETITE 8  | 8K-byte add-on  |
| PETITE 16 | 16K-byte add-on |
| PETITE 24 | 24K-byte add-on |
| PETITE 32 | 32K-byte add-on |

All units come with a detailed technical handbook and a six-month
warranty.  For details of price and delivery contact:

Plessey Microsystems Limited,
Water Lane,
Towcester,
Northants,
NN12

Tel: 0327 50312
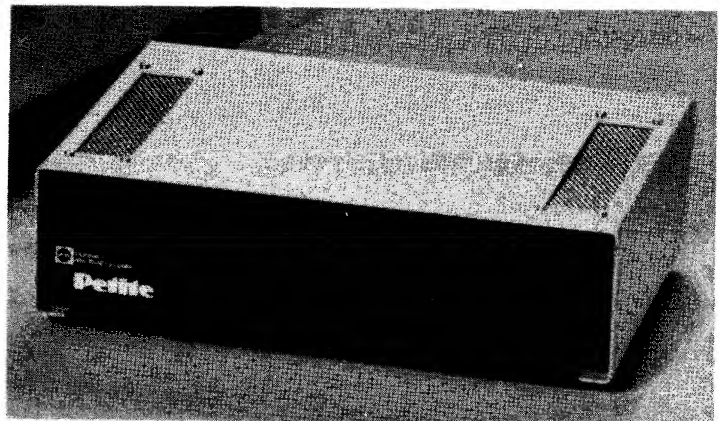
1,5

# commodore

# PET USERS CLUB

# NEWSLETTER

Issue No. 5

# sdk projects

39 Eveline Road
Mitcham
Surrey
01 640 5492

## ASCII IEEE-488/RS232C BIDIRECTIONAL INTERFACE

A powerful ASCII IEEE-488 to RS232C (V24) bidirectional serial interface has been developed for the discerning user who requires a comprehensive RS232C input/output for the Commodore PET. This interface not only contains IEEE-488 to RS232C conversion circuitry but also includes four additional important features.

1. Lower case letters and ASCII control characters which are required in many applications, are not coded within the PET as standard ASCII characters, hence before the PET can be used with other ASCII devices some recoding is necessary. In the SDK PROJECTS interface this conversion takes place within the interface using a 1 kbyte memory chip thus allowing all ASCII characters to be typed directly from the PET's keyboard. This conversion external to the PET allows the user to utilize all BASIC commands to their full usual potential.

2. When the interface is used to LIST a program, a unique code to identify programmed cursor control characters is printed. eg h = HOME, s (south) = ⇓, p = π, etc.

3. External time sharing computers (when using the PET as a terminal), disc storage and other systems require a delay after each CR/LF to empty their input buffers. The interface automatically holds the PET for 100ms after each CR/LF so allowing communication without loss of characters to occur.

4. A BREAK key is provided on the front panel to break transmission when using the PET as a terminal.

Due to the above features the SDK PROJECTS interface is ideally suited to:

1. Using the PET as a computer terminal. Only 4 lines of BASIC software are required.

2. An external ASCII keyboard can be used to type programs into the PET. A 5 line BASIC program is used which is quickly deleted afterwards.

3. ASCII RS232C disc systems can be used for business and other applications.

4. Printers can print lower case letters as well as cursor control characters.

5. Other applications include paper tape readers and punches, RS232C instruments, etc.

Subsets SH1, AH1, T4 and L2 of the IEEE-488 standard are supported. Eight different device numbers can be selected on DIL switches. Baud rates which are crystal controlled of 110, 300, 600 and 1200 as well as 1 or 2 stop bits can be selected in the same manner. A standard RS232C connecter and a cable with an edge connector for the PET are supplied. The power supply is fully regulated and the unit is contained in a high quality case.

The inclusive price of this high quality interface is £218-00 and delivery time is 2 to 6 weeks. Cheques and PO made payable to SDK PROJECTS with all orders please. The unit is covered by a 90 day warrenty.

# Applications

The application chosen for this issue comes from one of our dealers, PETALECT of Woking. The idea is original and shows some intriguing use of both hardware and software to solve a previously awkward problem - that of analysing accurate weight measurements. Anyone who is further interested in this system should contact PETALECT on Woking 20727.

## "SARTORIUS BALANCE  -  PET COMPUTER INTERFACE

The need for consumer-protection laws is obvious, and Britain has been a leader in this field of legislation, with many trading standards offices all around the country.

Britain is a member of the EEC however, and the EEC policy is to standardise many laws, especially in the area of trade, so as to facilitate the setting up of the proposed EEC "Free-trade" zone. It therefore became necessary to standardise the member countries' trading standards laws, and this has resulted in common 'Average-weight' regulations for most of Western Europe, due to come into effect this year.

Complications have resulted however in that the new EEC system is very time-consuming to work by traditional calculations, and the need for an Automatic System has arisen.

PETALECT ELECTRONICS LIMITED are a PET main dealer who were approached by one of Europe's main balance manufacturers, SARTORIUS, with a view to coupling their units to the PET computer. Systems were already available, but were very expensive, and the advent of computers like the PET made a lower priced system feasible.

Problems were encountered to start with because of the varying speeds of the two machines and the fact that the logic systems are different. This was overcome by development of an interface system which governs both the computer and the balance.

To keep the cost down, it was decided to use the User Port on the PET rather than the IEE-488 bus, and a hand-shake routine was developed which ensured that only reliable data from the balance is transmitted.

The actual interface box itself has two push buttons on, denoted 'READ' and 'TOTAL'. When the weight of an object is required, the 'READ' button is pressed and the data is fed to the PET when the balance has stabilised. The information is then stored by the PET until the 'TOTAL' button is pressed, and is then analysed to produce the required data.

A program has also been developed which conforms to the new EEC regulations. Trading-standard Departments in Hounslow, Berkshire and Merseyside will be using the system for their work.

Programs have been developed for use in other weights control applications, of such diverse items as biscuits, small metal products, pills, dog food and many others for manufacturers' production control department.

Work is currently progressing on a system for multiple-balance applications for use on permanent sites such as factory production lines.

These type of applications show, of course, that mini-computers such as the PET can be used in practically any application where data has to be analysed, and are particularly suited to long tedious operations, such as trading standards average weight control.

Peter Watts"

*    *    *    *    *    *    *    *    *    *    *    *

For an extremely interesting application, look in the latest issue of "PRACTICAL COMPUTING" (Vol 2 issue 1). The article shows how and why PANTHER put a modified PET into their top-of-the-range De-Ville cars.

# " Printout "

PRINTOUT is a new section in PET NEWS, in the style of a magazine column. It is aimed at all users who wish to make the most of their PET systems and concentrates on applications and programs which are useful as general purpose operating tools or utilities. Such an application forms PRINTOUT's first article starting on the next page.

Readers are invited to submit ideas, programs, and application descriptions, either direct to the PRINTOUT editor, or via the PET NEWS desk at Commodore. By including your name and address in your contribution, you will get free publicity for your system, with possible enquiries from other readers regarding purchase.

## COMPETITION.

Every issue of PRINTOUT will have a BASIC coding competition. The prize is a £10.00 credit voucher towards Commodore software from the current catalogue.

PRINTOUT competition No. 1
Write a BASIC routine to return in D$, a formatted date, given the day of month, month and year numbers.

Assume that the day of the month is already in D, month number in M and year in Y.

You are required to return in D$, the date formatted as follows:-

mmmsnttsyyyy

where mmm is the standard three letter abbreviation of the month name, s is one space, n is a one or two digit day number, tt is "st" or "nd" or "rd" or "th" according to the day number and yyyy is the year number.

e.g. 19, 1, 1979 in D,Y and M gives Jan 19th 1979 in D$.

The routine which occupies the least number of bytes (and works!) will win. Submit entries, on paper only please, either direct to me, or via Commodore Pet News. The closure date for entries is 21 days after the official publication date of this issue of Pet News.

Mike Gross-Niklaus,
(Editor, PRINTOUT)
25 Longdown Road,
Congleton, Cheshire.

# Simple Text Processor.

## 1. Background.

Having bought a printer for my PET, I wanted it to start earning it's keep as soon as possible. As one of a vast army of binary typists (the two finger variety) I saw the production of neat and accurately typed reports and letters as a useful application. The obvious method of achieving this was to write a Text Processor.

Because it was needed quickly, the program was kept simple. This article, produced using the processor, describes the main features of its design and implementation.

## 2. Over-all design.

Most text processors have two phases and this one is no exception. The two phases are:-

    A. Storage and Editing.
    B. Formatting and Printing.

To get it running quickly, the powerful but dedicated text editor, provided as part of the PET BASIC package, was used in preference to writing a purpose-made editor. The use of this editor is made possible by storing the text as part of the program.

Only a few formatting commands are provided but the program is structured so as to allow new commands to be added to the list later, without disturbing those which have already been coded. In use, these commands are embedded in the text.

The print routine is designed for the printer involved, an IBM 3982 golf-ball machine. This printer is connected to the user port. Most of the print routine is in machine code and lurks in cassette buffer 2.

At the start of each run, the user is asked for details of page size, line length and so on.

3. Storage and editing.

All text is stored in data statements at the front of the
program. Using the BASIC program editor, characters can be
deleted or changed in the usual way. Using normal
procedures, portions of text can be duplicated or swopped,
by editing data statement line numbers.

Insertion presents the usual problem in that the resultant
statement must not be more than 80 characters long. However,
by writing the text into statements numbered ten apart,
extra text can be inserted in the intervening lines with a
minimum of retyping.

There are a few small problems in using data statements for
text.

Firstly, to interpret leading and trailing spaces and commas
as text, each data statement must start with a " character
and is best ended with one as well.

Secondly, because quote marks are used in data statements as
delimiters, they cannot be used to represent text quotes. A
fix for this is to use some other rarely used PET character,
such as shift quote for example, and have the print routine
interpret it as a " character.

Thirdly, if one uses the PET keyboard in typewriter style,
shifting for upper case, while it is a simple matter to
write a conversion routine, the text in the data statements
will be 'reverse shifted', with upper case alphabet
appearing as lower case and vice versa. There appears to be
no easy way round this situation. However users of the
prototype system say that they have no problem in reading
the text in data statements.

4. Formatting.

The backbone of the processor is a routine which assembles
words from data statements and tries to fit them within the
line length specified at the start of the run. If it cant,
it calls a line feed and puts the word on the next line, and
arranges matters so that the line doesnt start with a space.

All formatting commands start with the symbol @ followed
by a mnemonic character and in some cases a single digit.
These are the commands implemented so far:-

F       Finish of text. The run ends.
L       Line end. A CR/LF is performed.
P       Paragraph end. Two CR/LFs plus an indent set at
        run time.
Tn      Tabs to tab marker n. The positions are input at
        run time.
C       Centers next line on the page.
Bn      n blank lines are inserted.
K       User entry via keyboard awaited.
A       Address( my own) printed in standard position.

## 5. Printing.

The IBM Selectric style printer was purchased from G.R.
Electronics of Newport, GWENT. Having been to their
premises, talked to the staff and seen them in action, I can
recommend this firm as one which produces rather than just
dreams. At present, the printers, one-user machines
renovated and resprayed, can best be used on the user port,
but I have seen an IEEE interface circuit, coupled to a PET
and printer in their lab, at an advanced state of
development.

With the user port model comes a cassette with a well
annotated machine code routine, which looks after the
conversion from PET codes to solenoid codes, and takes care
of the internal timing problems. The user is left to write
delays in BASIC to slow down the output to the user port but
G.R.L have included sample BASIC programs to show how this
is acheived.

## 6. Run time parameters.

Before starting to print text, the program asks the user for
a number of formatting parameters. A reply of zero at the
start causes default values to be assumed. The parameters
asked for are:-

Lines per page.
Characters per line.
No of characters indent for paragraphs.
Print positions for each of three tab markers.
Single or double line spacing.
Whether this is a print run or just display.
Today's date.
From which data statement the run is to start.

Use of the PRINT/DISPLAY parameter, together with page and
line length, enables the text to be checked and edited on
the screen before committing it to paper.

The RUN FROM? facility is a bit primative, a reply of 9 causing the run to start from the ninth data statement rather than statement nine. However, it has been found most helpful in checking edits without running through the entire text.

The DATE is used when processing letters, and appears suitably formated below my address, in response to an @ A command.

The LINES/PAGE is used with a line count by the program to tell the user when to feed in more paper.

## 6. Using the processor.

It is said the proof of a pudding is in its eating! This article was prepared, edited and printed in one afternoon using the processor. My wife uses it in connection with her varied social groups. My children type and edit home-work essays using it. The youngest said yesterday, "How did we ever manage before"? (The program was written less than two weeks ago!)

## 7. Future Developments.

At the cost of some storage space, a 'Dn' command is being written. This will allow automatic insertions from a data tape as well as the keyboard. Other facilities, such as modifying all occurences of a specified string of characters, will have to await the installation of a disc.

## 8.Conclusion.

This simple text processor has turned our PET into a most useful tool, helpful to all members of the family and is easy to use. If you would like a copy of this program, a cheque for £8.00, plus a stout self-addressed stamped envelope sent to the address below will get you one sent within three days.

Mike Gross-Niklaus,
25 Longdown Road,
Congleton,
Cheshire. CW12 4QH.

# Programming

We were very fortunate just before Christmas to have a visit
from Jim Butterfield from Toronto (author of "The First Book
of KIM").  He is also a leading expert on programming the
PET and we are indebted to him for showing us several routines -
some of which we shall be publishing in the Newsletter.  The
following article is based on a system shown to us by Jim
but originally conceived by Brad Templeton of Toronto.


MERGING PROGRAMS TOGETHER

Professionally written programs are very often made up from
standard, ready-written, sub-routines merged together with a
small amount of bespoke programming to fit a particular
application.  Many PET Users have standard sections (for
calculation or input/output for example) or lists of DATA
statements that can be used in several programs.  To have a
system whereby these sub-programs could easily be linked
together and interwoven directly from tape, without having
to type them out in full, would be very advantageous.  The
following describes such a method.

Sub-programs that may be required later for merging should
be recorded on tape as follows.  With the program in memory,
insert a blank tape and type:

OPEN1,1,1:CMD1:LIST

pressing 'Record & Play' when requested.  This saves the
program on tape but in the form of a data file.  When the
tape stops (note that the word READY has been recorded on
tape and not on the screen) type:

PRINT#1:CLOSE1

This finishes the recording process and puts your PET back
into normal operation.  The sub-program can be erased
with NEW.

Now if at a later stage you have a program in the memory, into which you want to merge the above sub-program, proceed as follows:

Insert the sub-program tape into the cassette and rewind. Then type:

OPEN1

Press PLAY as requested and wait for the tape to stop.

Here comes the tricky bit. Clear the screen, give 4 cursor down's, and type the following line, but DO NOT HIT RETURN:

POKE611,1:POKE525,1:POKE527,13:?"h"
(h is Cursor Home, displaying reverse S)

Don't hit RETURN. Instead, press cursor home and 6 cursor down's, then type the identical line. This time, hit RETURN at the end of the line and listen to the tape move.

When the merge is complete, a ?SYNTAX ERROR or ?OUT OF DATA ERROR message will appear between the two lines. The tape will stop (if it does not, press RUN-STOP) and the PET can be returned to normal operation by:

CLOSE1

New program lines will be inserted into the appropriate places according to line numbers. If the line numbers for two sub-programs would clash then a re-number routine should be used prior to the merge. It is good practice however to keep a library of standard sub-routines all starting at different line numbers. Be careful also, of using a variable name in more than one sub-program where they may get confused.


Richard Pawson

## Using RS232C or V24 Devices with the Commodore PET

The Pet has captured a large proportion of the market and still offers
outstanding value for money.  It is particularly encouraging to hear that
large quantities are being sold to Universities, schools, small businesses
and other non "personal" uses, as the Pet has undoubtably placed the power
of a small inexpensive computer system within the reach of these institutions
where their potential can be most effectively exploited.

It is inevitable that these users, as well as some home or "personal" users
will wish to acquire peripherals which can be used with the Pet.  Such
peripherals may include printers for data output and program listing, terminals
for data input and output, disc storage systems for fast information access, and
analogue to digital converters (ADC) and digital to analogue converters (DAC)
used to interface the Pet to the analogue world.  Another interesting and
important application is to use the Pet as a computer terminal in a large time
sharing network.  This puts the Pet within reach of a very powerful computing
facility with little additional cost.

With the exception of the ADC and DAC, the above mentioned units are normally
interconnected by the EIA RS232C or CCITT V24 standards.  This method entails
sending and receiving digital signals in a set serial fashion, each byte framed
by one stop bit, one or no parity bit, and one or two stop bits.  Most common
transmission speeds are 110 baud for the older systems and 300 baud for
new systems.  These are the speeds available on the Teletype 43, Digital
Decwriter II, Texas Silent 700 series, etc.  Other higher speeds are used
in faster printers and non time sharing systems.  Voltage levels are also
specified by these standards although the range  -12V to 12V is most popular,
the former meaning logical 0 whilst the latter logical 1.  This 24V difference
between 0 and 1 together with the advantage of a 3 wire basic communication
system makes the RS232C or V24 standards the ideal form of communication between
single systems placed close together or far apart.

Unfortunately the Pet does not have a RS232C input/output which, if one were
to exist, should clearly be supported by the necessary high level software
already available to the Pet.  As the user and memory ports are not supported
by BASIC software in the same manner as the IEEE-488 bus enjoys, the designer
is left with the only remaining option; the IEEE-488 bus should be interfaced
to the RS232C signal lines.

With the IEEE-488 bus the user can use the following commands.

N = logical file number, M = device number.

        PRINT#N,A,Z$,N%, etc
        CMDN:LIST
        CMDN:?A,Z$,N%,etc
        GET#N,A$

The INPUT#N command has been ommitted as it does not appear to operate when using a RS232C/IEEE-488 interface; the reason is not fully understood.

These powerful BASIC commands listed above can be demonstrated by the following applications when using RS232C devices.

A    Applications

1.   Using a terminal or printer with the Pet

There are many units on the market today which will still be purchased by the Pet user as a result of their excellent print quality and wide paper width. Printers only have the facility to provide hard copy outputs whilst terminal units, which very often cost only a little more, have the additional advantage of containing a high quality keyboard.  This latter facility allows large amounts of data such as names and addresses, stock, as well as programs to be typed into the Pet.

The following statements/routines can be used with terminals and printers.

1.1  To list a program use OPENN,M:CMDN:LIST
1.2  To print data use PRINT#N,A,...,Z$ in the program
1.3  To input data use GET#N,A$
1.4  To type a program into the Pet use the following routine

        1 OPEN 1,6
        2 GET#1,A$:IFST<>2PRINTA$;
        3 GOTO 2

When the VDU is nearly full, STOP the program, type HOME and hit RETURN over each new statement.  Hereafter type RUN CR and continue inputting the

program.  Upon completion type 1 CR 2 CR 3 CR to remove the inputting
routine.

This procedure can be automated by the short routine listed below.
Here ↟ and CR are POKED into the keyboard buffer, the line is printed
onto the screen and RUN is printed beneath, when a CR from the external
keyboard is sensed.  This is followed by two PRINTB$ which clear the
next two lines.  Finally the ↟ and CRs are executed by POKE525,9
after stopping the program which has the effect of placing the last typed
line into BASIC memory. When a CR is passed over the line "RUN"
the program commences once again.

```
∅ POKE59468,14:FORI=∅TO35:B$=B$+" ":NEXT
1 PRINT"↟";:OPEN1,6:FORI=527TO532:POKEI,145:NEXT:FORI=533TO534:POKEI,13:NEXT
2 GET#1,A$:IFSI<>∅THEN2
3 PRINTA$;:IFA$<>CHR$(13)THEN2
4 PRINT"RUN":PRINTB$:PRINTB$;:POKE525,9:STOP
```

## 2.  Using the Pet as a terminal

Another very useful application is to use the Pet as a terminal in a time
sharing system.  In the simplest example Pet can be used as a dumb terminal
in which case only the VDU and keyboard of the PET are used.  When the intelligence
of the Pet is to be exploited, commands such as LIST can dump a BASIC program
into the time sharing system to be stored or printed on the line printer, and data
can be transfered between the two systems by the PRINT#N,A,Z$ and GET#N,A,Z$
commands.

2.1 The routine to allow the PET to run as a terminal is listed below.  This
program is limited to speeds of up to 300 baud due to slow PRINT command
which takes 15ms to execute.  If full duplex is to be used omit the
statement PRINTA$; in line 3.

```
∅ OPEN1,6:POKE59468,PEEK(59468)OR14
1 GET#1,A$:IFST<>2THENPRINTA$;:GOTO1
2 GETA$:IFA$=""THEN1
3 PRINT#1,A$;:PRINTA$;:GOTO1
```

2.2 It is not possible to use the commands LOAD and SAVE with the time
sharing system for two reasons.

2.2.1 The Pet presently does not support these commands when the IEEE-488 bus is used.

2.2.2 Binary information which is non ASCII cannot be communicated. Most computer and peripheral systems use the ASCII code.

2.3 Pet programs can be "saved" in ASCII format by the statements OPENN,M:CMDN:LIST

2.4 A two stage routine is required if previously "saved" programs are to be "loaded" into the Pet.

2.4.1 Locate the incoming ASCII file in any region of unused RAM.

2.4.2 Transfer this memory to the screen and then place CRs over each line as described in 1.4.

Remember the program stored in BASIC memory differs from the program listing displayed on the VDU; BASIC commands such as FOR, REM. etc are identified by a non ASCII code in BASIC memory.

## 3. Using RS232C disc units with the Pet

The protocol to communicate with disc units is identical in concept as those techniques described above for terminal operation. The Pet becomes an intelligent terminal attached to the disc unit.

## B IEEE-488/RS232C interfaces for the Pet

Clearly an interface should support those Pet commands described earlier.

The ideal IEEE-488/RS232C interface should contain the following functions.

1. On the IEEE-488 side, subsets AH1, SH1, T4, and L2 should be supported as these subsets are used by the Pet. The interface is then guaranteed to operate on the same bus as other IEEE-488 devices already connected to the Pet. Note that device numbers 0 to 3 are used internally and hence devices with numbers between 4 and 15, or altogether 12 devices, can be used.

Crystal controlled baud rates of 110 to 300 baud should be available for general terminal and printer use while 600 and 1200 baud should be available for high speed printers. The number of stop bits should be switch selectable and a reasonable range of device numbers should exist.

2.  As the Pet does not fully obey the ASCII character set, a comprehensive code conversion facility is required to make the Pet compatible with other ASCII devices. The following code conversion is required.

2.1  All lower case letters must be converted. The Pet uses the range 193 to 218 whilst ASCII requires the range 97 to 122. This conversion should occur with input and output.

2.2  The ASCII control character set is useful when using a printer eg. line feed (LF), form feed (FF), and essential when using the Pet as a terminal or when using a ASCII disc system with the Pet. Pet only supports two of the commands viz. CR and SP. As those graphic characters which do not clash with lower case characters are not used in other ASCII devices, they can be safely recoded as ASCII control characters. Pressing any of these keys will then transmit the proper ASCII character.

2.3  The cursor right key ⇒ , must be changed to space.

2.4  The Pet's DEL should be changed to ASCII BS.

This conversion should preferably take place within the interface as this then allows Pet's BASIC commands to be used in their normal fashion.

3.  A BREAK key should be included in the interface to break transmission from the time sharing computer.

4.  When using the Pet as a terminal to a time sharing computer systems, a time delay of typically 100ms is required for the computer to empty its input buffer. Some BASIC interpreters of other manufacturers include a NULL(I) command which appends I null characters after each CR/LF. Unfortunately this software facility is not available on the Pet and hence the interface should contain such a delay function.

C    Conclusions

Although the IEEE-488 bus is very versatile in its function, it is unfortunate
that the user must pay considerably more for peripherals and instruments
containing this facility.  The popular RS232C range does not suffer this
cost disadvantage and it should be clear to the user that the addition of
an ASCII RS232C input/output port allows the Pet user to have access to a
large range of RS232C peripherals which may be suited to his application.


G. C. Klintworth

## FINDING THE DURATION OF A KEY PRESS

If a key is depressed while a program is running we can use its value in the program with GET A, but if GET A is executed a second time while the key is still held down it will return a Ø in A.  If we wished to use the value of A to control, say, the frequency and <u>duration</u> of a musical note we would have to be able to detect how long the key is held down.

1Ø DEF FNK(x)  =  -(PEEK(515)=26)-2*(PEEK(515)=18)-3*(PEEK(515)=25)
will return a Ø unless keys 1, 2 or 3 are depressed.  In those cases it will return 1, 2 or 3 for as long as the key is held down.

Test it with      2Ø    PRINT "   "; FNK (Ø)
                  3Ø    GOTO 2Ø

Clearly this definition of FNK is rather clumsy.  It is used because it makes the operation of the function obvious. Using some logical operators it should be possible to detect all the numeric keys.  Any suggestions?

If you wish to use the keys to control the program as above, but do not want to get a string of numbers printed when the program stops, then before the end of the program poke the keyboard buffer pointer back to Ø with POKE525,Ø.

<u>Robert Chrismas</u>   (B.Sc.)

ED:  *This has quite a few applications such as controlling the rate at which information scrolls on the screen and in drawing programs. It is obviously very useful in games programs.*

# Users' Directory & Announcements

The Mersyside Microcomputer Group has recently started distributing a newsletter for a subscription of £2 per annum.  Sub-groups are apparently being formed to cater for specialist interests and anyone interested in joining a PET Users Group on Merseyside should contact:

Mr. John Stout,
Department of Architecture, Liverpool Polytechnic    Tel: 051-236-0598

    *  *  *  *  *  *  *  *  *  *  *  *

MILLHOUSE DESIGNS LIMITED (now a PET Dealer) have announced a range of interfaces to couple printers, tape punches and TV monitors to the PET.  Also available  is a new multi-purpose control unit for driving relays, lights, etc, from User-determined data.  For further information ring 042050-374.

    *  *  *  *  *  *  *  *  *  *  *  *

The MICRO 6502 JOURNAL (hailed as being the best regular publication for machine code users) is now available from:

L.P. Enterprises,
313 Kingston Road, Ilford, Essex            Tel: 01-553-1001

Copies are £1.50 each and a six-issue subscription costs £7.50.  Back numbers are regrettably not available.

    *  *  *  *  *  *  *  *  *  *  *  *

Anyone interested in forming a PET Users' Education Group to exchange ideas and programs (particularly relating to Computer Assisted Learning) should get in touch with:

Christopher Smith,
Department of Physiology, Queen Elizabeth College, Campden Hill Road,
Kensington, London W8 7AH          Tel: 01-937-5411

*ED:   We would be prepared to include an Education Users' Section in
       the Newsletter if someone will offer to edit it.*

      *   *   *   *   *   *   *   *   *   *   *   *

Electronic and General Services Limited, 89 Railway Street, Hertford, Herts, are offering a number of service facilities for the PET and related peripherals in the North London, Hertfordshire, Bedfordshire and Essex area.   Both chargeable repairs and maintenance contracts are available with a special fast 'call out' for urgent repairs.  For further information ring Hertford 57423.

      *   *   *   *   *   *   *   *   *   *   *   *

A high quality PVC material dust cover is available from:

Sumlock Electronic Services Limited,
196 Deansgate, Manchester, M3 3WE

The cover, designed specifically to
fit the PET is matt finish beige in
colour and costs £6.48 including VAT.
Alternatively, the cover is available
printed with the Commodore name and
logo on the front for £7.02 including
VAT.  Postage and Packing is 50p.
For further details ring 061-228-3507.
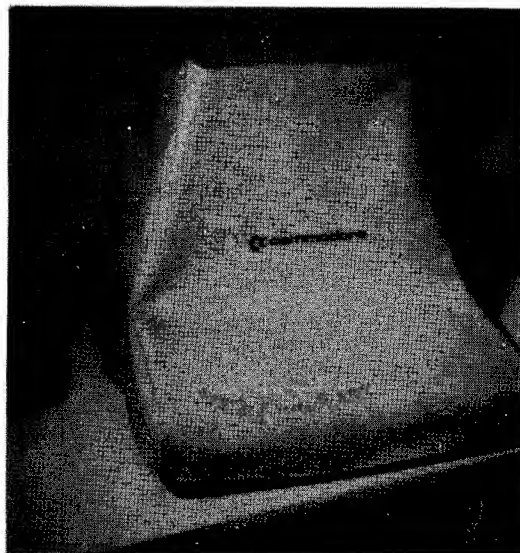
USERS' DIRECTORY

Mr. P. Scammell
112 Haven Green Court, Ealing, London W5 2UX
Cheap Hardware Expansion/Software (All)


Intex Datalog Limited
Eaglescliffe Industrial Estate, Eaglescliffe, Cleveland
Payroll Maintenance Contract £69.50pa within 30 miles' radius of Eaglescliffe


Mr. Jan Vasek
20 Westhall Road, Kew, Richmond, Surrey, TW9 4EE
Setting up a South-West London Users' Group


Francis T. Chambers
Rock House, Ballycroy, Westport, Co. Mayo, Ireland
Complex Games, Dynamic Graphics, Programmable Character Generator


J. R. Mace
Dept. of Accounting & Finance, Gillow House, University of Lancaster, LA1 4YX
Software for Students of Accounting and Finance


Joan Smith
The Cottage, Stockwood Vale, Keynsham, Bristol BS18 2AL
Organisation & Methods/Systems Analysis & Programming/Business Problem Advice


Dr. D. Lavelle
29 Shore Road, Holywood, BT18 9HX
Engineering/Building Services


Mr. A. Clark
Dept. of Civil Engineering, University of Newcastle upon Tyne, NE1 7RU
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Anthony Mothew
7 Ashfields, Loughton, Essex (Home 01-508-8355, Work 01-472-5347/4474)
Private pilot (Aviation & Navigation)

Alan M. Robertson

Weissenbruchstraat 44, Roosendaal, Nederlands

Industrial Control Stepping Motor, DC Motor Interfaces.


Mr. Bertil Andersson,

Processelektronik, Box 346, Västeras, 72107, Sweden

Software & Hardware, Interface, for process control


Mr. Lars Long

85 Wyebank Road, Tutshill, Chepstow, Gwent, NP6 7SA

Software & Hardware, Interface, for process control


John C. Nuttall

56 West Street, Shoreham-by-Sea, Sussex

Local PET Users' Group


*NOTE:*     *If you are interested in one of the services listed above, please*
            *contact the person concerned and not Commodore. In printing*
            *this information, we are not making recommendations and cannot*
            *vouch for the validity of any statements made. To include your*
            *name and address in the Users' Directory, please fill in the*
            *form below.*

---------------------------------------------------------------------------

To:  The Editor, PET Users Club, Commodore Systems,
     360 Euston Road, London NW1 3BL


NAME   ...............................................................


ADDRESS   ............................................................


          ............................................................


Services Offered/Specialist area of interest:   ....................


...................................................................


To include as many contacts as possible, we must restrict each User
to only one line of description.


Commodore reserves the right to edit or withdraw any entry.

# Letters

Letters should be addressed to:

The Editor,

PET Users' Club,

Commodore Systems,

360 Euston Road,

London NW1 3BL

## LINKING PROGRAMS

From Mr. B. C. Oliver, DHSS, Euston Tower, 286 Euston Road, London NW1 3DN

"Having successfully joined together three 6K programs now that my PET micro-computer has been enhanced to 32K, I have ascertained, with much frustration, that it is essential to carry out a further action in addition to those given in the "PET Users' Club Newsletter No. 3".

Once joined in the machine it is essential, on my machine at least, to locate the last remaining line of the overlay program, place the cursor on the line and consolidate the union of the two programs by pressing the return key.

If this is not done then, if editing is carried out on the joined programs, you will lose contact between the two programs and lose access to the overlaid program.

If no changes are made to the overlay program it is possible to rejoin it to the overlaid program by poking the necessary locations for the go forward addresses for the last line. This only seems to work however for a limited number of times and subsequently the join is lost completely. It is then necessary to run the overlay process from scratch once again.

I repeat however the solution, once known, is easy; consolidate the go forward address in the last line of the overlay program."

*    *    *    *    *    *    *    *    *    *    *    *

SHOW TAPE MODIFICATIONS


From Mr. H. Broomhall


          "The following changes modify the SHOW TAPE program (PET
Users' Handbook) to show filenames as well:-


Change line 160 to read:-


160 OPEN1: FOR N=825 TO 634 STEP-1: IF PEEK(N)<>32 THEN 162


Add the following lines:-


161  NEXT N
162  IF N<639 THEN PRINT "cs  NO FILENAME": GOTO 170
163  PRINT "cs  FILENAME: ";: FOR J=639 TO N: PRINT CHR$(PEEK(J));: NEXT J: PRINT


cs represents Clear Screen."